



Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at <http://about.jstor.org/participate-jstor/individuals/early-journal-content>.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

THE ARRANGEMENT OF COLLECTIONS OF METEORITES.

BY DR. ARISTIDES BREZINA, VIENNA.

Late Director of the Mineralogical Department of the Natural History Museum at Vienna.

(Read April 8, 1904.)

In making a collection of any kind of matter two ends must be kept in view; firstly, to secure in due time and to preserve as great and complete a variety of the material as possible, and secondly, to illustrate as fully as possible all ways in which the matter may be considered.

According as a collection provides for the first or the second purpose it is called a *systematic* or a *synoptical collection*.

Until 1889 there existed meteorite collections of the first kind only; in this year the new Natural History Museum of the Court at Vienna was to be opened; and as for a hundred years this collection had been worked upon by *Chladni*, *Schreibers*, *Widmanstätten*, *Partsch*, *Haidinger*, *Hörnes*, *Wöhler*, *Tschermak* and myself, most of its specimens from different localities had been investigated structurally and chemically so thoroughly, that I could for the first time divide the material into ten great series.

They were disposed as follows:

I. Ancient coins on which sacred meteorites were represented.

II. Historical meteorites which were worshiped by primitive nations or which formed standards in the development of meteoric science; related bodies, as fallen dust, bloody rain, meteor-paper, nuclei of hail and pseudo-meteorites.

III. Specimens of meteorites which show processes of melting, incrustation, cleaving and faulting, black and metallic veins, etc., (celestial alterations); and the results of experiments on meteorites for producing similar alterations.

IV. Specimens showing terrestrial alterations, viz., deformation by falling on the earth, erosion of the surface by terrestrial agents, chemical alteration after the fall, formation of new constituents by humidity, etc.

V. The constituents of the meteorites, from simple minerals

to complex bodies, free and in combination; artificial products, meteorites and their minerals formed synthetically.

VI. Slices through whole meteorites from all petrographic groups, showing the general structure on large surfaces.

VII. A series of specimens of equal size and normal constitution of all groups of meteorites, free from extraordinary inclusions, but showing the differences between pieces of the same fall; this series was intended to allow of a quick determination of the group to which a new meteorite belongs.

VIII. A collection of microscopic slides of all meteorites fit for microscopic study.

IX. The systematic collection, containing the main mass of the collection, arranged from the petrographical and mineralogical points of view.

X. Casts of all meteorites of characteristic outer form.

A collector who has considerable means at his disposal should begin by forming a systematic collection. An excellent example of such a collection built up within a moderate number of years is the Ward-Coonley collection, whose catalogue has lately been published. It represents a greater number of localities than any other public or private collection in the world, nearly 90 per cent. of all meteorites known; and it averages so high in weights, that later it may from its surplus furnish the material for all kinds of researches and for exchanges on the largest scale, so that it will be independent from acquisitions by purchases for a long time and will permit of the formation by and by of a synoptical collection.

In the following pages I give the description of a collection of this second kind, which I have formed since 1896, derived from a small number of monopolized falls by numerous exchanges. This description may serve as a guide for collectors who intend to develop a synoptical collection out of the material of a systematic one.

I. BETYL COINS.

The ancients supposed the stars to be the domiciles of the gods; falling stars and falling meteorites signified the descending of a god or the sending of its image to earth.

These envoys were received with divine honors, embalmed and draped and worshiped in temples built for them.

From about 400 (or 500) B.C. to 300 A.D. coins were struck in honor of these divinities by emperors and autonomous cities.

In general the images were rather naturalistic in older times and became human-like (iconic) afterward.

Many of these betyl coins represent stones reported expressly to have fallen from heaven; some of them present as a common feature the likeness to conic stones, or obelisks or to archaic, half-iconic simulacra; so it comes that similar representations of unknown origin were likewise supposed to represent sacred meteorites.

A. Betyls Reported to Have Fallen from Heaven.

1. *The Omphalos of Delphi.*—A black stone which was given by Rhea to Uranos instead of the new-born Zeus, and rendered to Zeus after his victory over Kronos; Zeus or Saturn threw it on the Earth, on the point which was considered as the centre of the Earth.

Eleuthernai, Kreta; Autonomous 2 AE.¹

Makedonia; Philippus II AR. Pl. I, Fig. 1.

Myrina, Aiolis; Auton. AR. Fig. 2.

Nakrasa, Lydia; Auton. AE. Fig. 3.

Neapolis, Campania; Auton. 3 AE. Fig. 4.

Parthia; Tiridates 3 AR, Fig. 5, Arsaces II AR, Phriapatius AR, Phraates I 4 AR, Mithradates I 5 AR. Fig. 6.

Roma, Italia; Sabina AE.

Syria; Antiochus I Soter 10 AR, Fig. 7, Antiochus II Theos AR, Antiochus Hierax 2 AR, Seleucus III Ceraunus 3 AR, Antiochus filius AR, Antiochus III Magnus 17 AR, Seleucus IV Philopator 2 AR, Antiochus IV Epiphanes AR, Demetrius I Soter 3 AR, Fig. 8, Alexander I Bala 4 AR.

2. *The Stone of Emisa, El Gabal.*—A black, conical stone, which Herodian reports to have fallen from heaven; Elagabal transferred it to Rome, where it remained until 222 A.D.

¹ AE bronzes, AR argent, AV aurum (gold); the number before gives the number of different kinds represented: 2 AE, two bronzes.

Emisa, Seleukis and Pieria; Antoninus Pius 2 AE. Fig. 9.
Roma, Italia; Elagabalus 3 AR. Fig. 10.

3. *Zeus Kataibates*.—The descended god, who was represented sitting on a throne.

Kyrrhos, Kyrrhestika; Trajan AE, Fig. 11, Antoninus Pius 2 AE, Marcus Aurelius 2 AE, Lucius Verus AE, Commodus AE, Elagabal AE, Philippus pater AE, Fig. 12, Philippus filius 2 AE.

4. *Aphrodite Paphia*.—A stone said to have fallen from heaven as an image of the Paphian Aphrodite; an elongated cone in a temple of two columns.

Kypros; Galba AE, Vespasian 4 AR, Fig. 13, AE, Trajan AE, Septimius Severus AE, Julia Domna AE, Caracalla AE. Fig. 14.

5. *Artemis Ephesia*.—Image of Artemis reported to have fallen from heaven and been preserved in the temple of Ephesos. Form half-iconic.

Aizanis, Phrygia; Auton. AE, Commodus AE. Pl. II, Fig. 15.

Ankyra, Phrygia; Sabina AE, Faustina jun. 2 AE, Julia Domna AE.

Ephesos, Ionia; Antoninus Pius AE.

Ephesos and Pergamon; Commodus AE, Gallienus 2 AE. Figs. 16, 17.

Eumeneia, Phrygia; Auton. AE.

Nakrasa, Lydia; Auton. 2 AE.

Philadelphia, Lydia; Auton. AE.

Provincia Asia; Claudius AR, Fig. 18, Hadrian 2 AR.

Roma, Italia; Hostilia AR. Fig. 19.

Tabai, Karia; Auton. AR.

Tiberiopolis, Phrygia; Trajan AE.

6. *Stone of Astarte*, which fell as a star from heaven and was raised by Astarte, who consecrated it to the town of Tyros; a second stone of Astarte was worshiped at Sidon (represented laying on a car), and some coins of Tyros exhibit both stones (the Ambrosian petræ).

Sidon, Phoinikia; Auton. 3 AE, Hadrian AE, Caracalla AE, Elagabal 9 AE, Fig. 20, Julia Soæmias AE, Julia Mæsa AE, Annia Faustina AE, Alexander Sever AE.

Tyros, Phoinikia; Elagabal AE, Fig. 21, Valerianus pater AE, Salonina AE

B. Betyls Accepted by Analogy to Represent Meteorites.

7. *The Pyramids or Obelisks of Apollon.*—

Ambrakia, Epeiros; Auton. 3 AE.

Apollonia, Illyria; Auton. 3 AE. Fig. 22.

Megara, Megaris; Auton. AE.

Myrina, Aiolis; Auton. AE.

8. *The Herms of Hermes, Ithyphallos and Priapos.*—

Makedonia; Alexander III Magnus AR. Fig. 23.

9. *Telesphoros.*—

Akrasa, Lydia; Auton. AE.

Eukarpeia, Phrygia; Auton. AE. Fig. 24.

Hadrianeia, Mysia; Antoninus Pius AE.

Roma, Italia; Caracalla AE.

10. *The Two Stones of Zeus Dolichenos or Herakles Sandan.*—

Syria (Tarsos); Antiochus VIII Grypus 3 AR, Fig. 25, Antiochus IX Cyzicenus AR.

Tarsos, Kilikia; Auton. 6 AE.

11. *Zeus Kasios*, represented as a conical stone suspended by a chain in a strap.

Seleukeia, Seleukis and Pieria; Trajan 8 AE, Fig. 26, Antoninus Pius 2 AE, Marcus Aurelius AE, Commodus AE, Septimius Severus AE, Caracalla AE, Alexander Severus AE.

12. *Conical or Quadratic Stones* without determination.—

Mallos, Kilikia or Rhosos, Seleukis and Pieria; Auton. 2 AR. Fig. 27.

Perga, Pamphylia; Gallienus AE.

Synnada, Phrygia; Gallienus AE. Fig. 28.

13. *The Conical Stone of Aphrodite Urania.*—

Makedonia (Uranopolis); Alexander III Magnus 12 AR. Pl. III, Fig. 29.

Uranopolis, Chalkidike; Auton. AE.

14. *The Simulacrum of Artemis Anaitis*, half-iconic.—

Apameia, Phrygia; Auton. AE.

Hypaipa, Lydia; Trajan AE. Fig. 30.

15. *The Simulacrum of Artemis Leukophrys*, half-iconic.—

Magnesia ad Mäandrum, Ionia; Auton. AE. Fig. 31.

16. *The Simulacrum of Artemis Pergaia*; a cone with human head.—

Kaisareia, Kappadokia (Provincia Asia); Trajan AR. Fig. 32.

Perga, Pamphylia; Auton. 2 AE, Trajan AE, Caracalla AE, Diadumenian AE, Tranquillina 2 AE, Fig. 33, Philippus pater 3 AE, Valerianus pater AE, Gallienus 3 AE, Aurelian AE.

Pogla, Pisidia; Antoninus Pius AE.

Provincia Asia; Nerva 2 AR, Trajan 3 AR. Fig. 34.

17. *The Simulacrum of Astarte*, half-iconic.—

Gabala, Seleukis and Pieria; Macrinus AE.

18. *The Conical Stone of Hera*.—

Chalkis, Euboia; Auton. AE. Fig. 35.

19. *The Simulacrum of the Samian Hera*, half-iconic.—

Panionion, Ionia; Marcus Aurelius AE. Fig. 36.

Samos, Ionia; Caracalla AE, Fig. 37, Alexander Severus 3 AE, Philippus pater 2 AE, Trajanus Decius 2 AE, Etruscilla 2 AE, Gallienus AE, Fig. 38.

20. *The Simulacrum of Persephone*, half-iconic.—

Julia Gordos, Lydia; Marcus Aurelius AE.

Sardes, Lydia; Auton. AE, Fig. 39, Salonina 2 AE.

Sardes and Hierapolis; Philippus pater AE.

21. *Archaic Simulacrum of Double Goddess*.—

Capua, Campania; Auton. AE.

C. Related Celestial Bodies.

22. *Comets*.—

Roma, Italia; Sanguinia (Julius Cæsar) AR, Augustus 5 AR. Fig. 40.

Silesia, Germany (modern); Auton. AV, Fig. 41, 2 AR, AE.

II. HISTORICAL METEORITES.

Mordvinovka, Ekaterinoslav, Russia. Prehistoric. Cw.¹ 1 gram, 2 cm.

Casas Grandes, Mexico. Prehistoric. Om. 102 gr. 26 cm.

These two meteorites were found in prehistoric tumuli.

¹The symbols following the date of fall designate the petrographic group as defined later on (VII, System of Meteorites). Weight and profitable surface are added in grams and square centimeters.

Wichita county, Brazos, Texas. Found 1836. Og. 168 gr. 44 cm. Worshipped by Indians as coming from "the Great Spirit."

Kesen, Iwate, Japan. Fell June 13, 1850. Ccb. 8 gr. 5 cm. Worshipped in a temple of Iwate as a betyl.

Ensisheim, Alsace, Germany. Fell November 16, 1492. Ckb. 10 gr. 5 cm. Oldest meteorite of known fall.

Elbogen, Bohemia. Known since about 1400. Om. 12 gr. 4 cm. The so-called "verwunschene Burggraf." Said to have occided in 1410 the burggrave Botho von Eulenburg, defamed for his cruelty, the ancestor of the principles of Eulenburg.

Krasnojarsk, Siberia. Found 1749. Pk. 25 gr. 8 cm. The meteorite on which Chladni demonstrated the cosmic nature of these bodies.

Albareto, Modena, Italy. Fell July, 1766. Cc. 3 gr. 2 cm. The fall was described carefully by the Jesuit Troili in the paper "Della caduta di un sasso dell' aria." Modena, 1766, 128 pages.

Barbotan, France. Fell July 24, 1790. Cga. 9 gr. 4 cm. These stones were thrown away by the Paris Academicians, who feared the ridiculousness, if believing in the reality of the fact of falling stars.

Laigle, France. Fell April 26, 1804. Cib. 115 gr. 18 cm. The fall was examined carefully by the celebrated Biot and dissipated the doubts in France.

Borodino, Russia. Fell September 5-6, 1812, during the battle of Borodino, in the chief-quarter of the Russians. Cgb. 5 gr. 2 cm.

Mazapil, Mexico. Fell November 27, 1885, with the Bielid star-shower which replaced the disappeared Biela comet. Om. 11 gr. 15 cm.

Bjurböle, Finland. Fell March 12, 1899, in the bottom of Stensböle Fjärde, and was raised by divers; shows adhering sea-ooze. Cca. 61 gr. 12 cm.

Breslau, Silesia. Fell January 31, 1848. 4 gr.—Rescht, Persia. Fell September 10, 1864. 3 gr.—Nacimiento del Rio Colorado, Argentina. Fell 1883. 1 gr.—Meteoric dust containing nickel.

Neusohl, Hungary. Fell January, 1848. 0.3 gr.—Niedertenzel, Bohemia. Fell February 18, 1899. 11 gr.—Terrestrial dust containing no nickel.

Ivan, Oedenburg. Hungary. Limonite pebbles which fell August 10, 1841, in accumulations of hundreds of tons, being raised by a cyclone from the exsiccated grounds of Lake Neusiedel.

III. SCATTERING OF METEORITES.

Brenham, Kansas. Found 1885. Pk. Free of olivine. 250 gr. 38 cm.—Brenham, Kansas. Found 1885. Pk. Rich in olivine. 109 gr. 45 cm.—Glorietta, New Mexico. Found 1884. Pk. Free of olivine. 119 gr. 36 cm.—Members of the chain-fall Brenham ($37^{\circ} 38' N.$, $99^{\circ} 13' W.$), Glorietta ($35^{\circ} 52' N.$, $105^{\circ} 30' W.$), Port Orford ($42^{\circ} 46' N.$, $123^{\circ} 10' W.$).

Lerici, Italy. Fell January 30, 1868, 7 p.m. Cga. 6 gr. 3 cm.—Pultusk, Russia. Fell January 30, 1868, 7 p.m. Cgb. 57 gr.—Alike in structure, fell at the same time on a line coinciding with the flying-line of Pultusk; Lerici $44^{\circ} 4' N.$, $9^{\circ} 55' O.$, Pultusk $52^{\circ} 42' N.$, $21^{\circ} 23' O.$

Vaca Muerta, Chile. Known 1861. Mg. 30 gr. 11 cm.—Cerro la Bomba, Taltal, Chile. Found 1888. Mg. 151 gr. 18 cm.—Quebrada Huanilla, Cachinal, Chile. Found 1887. Mg. 2 gr. 2 cm.—Mejillones, Chile. Found 1867. Mg. 1 gr. 1 cm.—Pieces misplaced by rancheros.

Lion River, Great Namaland. Found before 1853. Of. 27 gr. 7 cm.—Bethany-Berseba, Namaland. Known in 1874. Of. 4 gr. 3 cm. Mukerop, Gibeon, first block. Found in 1899. Of. 500 gr. 42 cm.—Mukerop, Gibeon, second block. Known in 1902. Of. 673 gr. 36 cm.

Lion River circa $23^{\circ} 40' S.$, $17^{\circ} 40' W.$; Bethany $26^{\circ} 30' S.$, $16^{\circ} 49' W.$; Berseba $26^{\circ} 0' S.$, $17^{\circ} 42' W.$; Gibeon $25^{\circ} 6' N.$, $17^{\circ} 48' W.$

IV. MELTING AND FUSION, SCORIFICATION, FAULTING, SEPARATING.

Stannern, Moravia. Fell May 22, 1808. Eu. 162 gr. 28 cm. Crust melted easily; fritted earth on front side.

Juvinas, France. Fell June 15, 1821. Eu. 21 gr. 9 cm. Crust melted easily, with small rolls.

Mócs, Hungary. Fell February 3, 1882. Cwa. 135 gr. Five individuals; crust thick, scorified.

Orvinio, Italy. Fell August 31, 1872. Co. 30 gr. Whole individual orientated, scorified crust, interrupted.

Kernouvé, France. Fell May 22, 1869. Cka. 173 gr. 42 cm. Crust loose, scabby, partly fallen off.

Antifona, Italy. Fell February 3, 1890. Cc. 241 gr. 42 cm. Apex of the stone with radial drift.

Aleppo, Turkey. Found 1873. Cwb. 67 gr. 15 cm. Crust of back, scoriated and bubbly.

Pultusk, Russia. Fell January 30, 1868. Cgb. 233 gr. 30 cm. Whole individual, highly orientated; front crust primary, back crust secondary, thin.

Knyahinya, Hungary. Fell June 9, 1866. Cg. 292 gr. 50 cm. Highly orientated whole individual, front drift, roll border; back crust thin, brown, crust-sprinkled.

Knyahinya. 127 gr. 18 cm. Individual of loaf form with uncovered striking spots.

Estherville, Iowa. Fell May 10, 1879. M. 40 gr. 6 and 3 cm. Two whole individuals, the one with metallic, the other with stony crust.

Marjalathi, Finland. Fell June 1, 1902. Pi. 147 gr. 22 cm. Black crust, fine-drusy and even over the iron, even and bright over the olivine.

Glorietta, New Mexico. Found 1884. Pk. 492 gr. 40 cm. Highly orientated individual, free of olivine; front drift, roll border, back crust loose, partly fallen off.

Pultusk, Russia. Fell January 30, 1868. Cgb. 252 gr. 30 cm. Whole individual, polyhedral flake with primary crust.

Pultusk, 154 gr. Thirty-eight whole individuals of equal weight (4 grams each) with primary and secondary crust.

Hessle, Sweden. Fell January 1, 1869. Cc. 10 gr. 4 cm. Whole individual with four primary faces; apex-concavity after chondrule has fallen out.

Hessle. 13 gr. 5 cm. Individual of flake form.

Kansada, Kansas. Found 1897. Cib. 135 gr. 22 cm.

Whole individual, primary faces, partly even, partly piezoglyptic.

Forest, Iowa. Fell May 2, 1890. Ccb. 83 gr. Five individuals with faces partly polyhedral, partly rounded.

Cañon Diablo, New Mexico. Found 1891. Og. 122 gr. 28 cm. Individual in form of acute-angular, piezoglyptic flake.

Cañon Diablo. 51 gr. Twelve individuals of similar sharp angular flake form.

Aumières, France. Fell June 3, 1842. Cwa. 18 gr. 5 cm. Flawy crust (craquelé) on concave face.

Dhurmsala, India. Fell July 14, 1860. Ci. 257 gr. 40 cm. Stone which was extremely cold when it reached the earth.

Ochansk, Russia. Fell August 30, 1887. Ccb. 12 gr. 5 cm. Infiltration of crust and crust-drops on uncovered fissure, issuing from bubbly scoriaceous crust.

Girgenti, Italy. Fell February 10, 1853. Cwa. 132 gr. 22 cm. Parallel infiltration-veins with lateral apophyses. Plate IV, Fig. 42.

Fisher, Minnesota. Fell April 9, 1894. Cia. 208 gr. 27 cm. Ramified crust-infiltration.

Maêmê, Japan. Fell November 10, 1886. Cia. 97 gr. 24 cm. Chondrule transpierced by infiltration-vein.

Aumières, France. Fell June 3, 1842. Cwa. 18 gr. 5 cm. Chondrule faulted by a black vein.

Baratta, New South Wales. Fell May, 1845. Cgb. 45 gr. 18 cm. Broken chondrule, the parts dislocated.

Château-Renard, France. Fell June 12, 1841. Cia. 80 gr. 12 cm. Thick harness uncovered.

Ställdalen, Sweden. Fell June 28, 1870. Cgb. 34 gr. 9 cm. Harnesses in different directions, partly uncovered.

Alessandria, Italy. Fell February 2, 1860. Cga. 15 gr. 5 cm. Harnesses and black crust-veins.

Zavid, Bosnia. Fell August 1, 1897. Cia. 310 gr. 31 cm. Thin harness on even rupture-face.

Lasdany, Russia. Fell June 12, 1820. Cga. 77 gr. 12 cm. Harnesses on uneven rupture-faces.

Badger, New Mexico. Known 1897. Om. 427 gr. 45 cm.

Empty octahedral fissures, crust in an excavation, stowing of lamellæ.

Badger. 461 gr. 30 cm. Octahedral fissures filled with magnetite; faulting and bending of lamellæ.

Chantonay, France. Fell August 5, 1812. Cgb. 89 gr. 25 cm. Fluidal structure of black parts.

Mócs, Hungary. Fell February 3, 1882. Cwa. 6 gr. Unchanged original mass and pieces heated in copper enclosure (blackened)

Knyahinya, Hungary. Fell June 9, 1866. Cg. 4 gr. Heated in copper enclosure and blackened.

Albareto, Italy. Fell July, 1766. Cc. Ignition preparation (from old Italian experiments).

Arlington, Minnesota. Found 1894. Om. 28 gr. 6 cm. Iron-enamel, alteration-zone along natural surface.

Ngoureyima, Algiers. Fell June 15, 1900. Obzg. 29 gr. 7 cm. Iron-slag in fissure; molten and tracted mass.

Carlton, Texas. Found 1887. Off. 147 gr. 30 cm. Iron-slag in concavity; bending and faulting of lamellæ.

Jamestown, Dakota. Found 1885. Of. 69 gr. 20 cm. Melting-slag and alteration-zone.

Mukerop (Bethany), Namaland. Found 1899 (1853). Of. 350 gr. 30 cm. Melting-slag and alteration-zone.

Reed City, Michigan. Found 1897. Oge. 122 gr. 23 cm. Mollified; alteration-zone.

Hammersley, Australia. Found 1894. Om. 119 gr. 22 cm. Alteration-zone of 60 mm. thickness.

Silver Crown, Wyoming. Found 1887. Og. 134 gr. 35 cm. Alteration-zone of 3-4 mm. thickness. Plate IV, Fig. 43.

Sarepta, Russia. Found 1854. Og. 19 gr. 9 cm. Alteration-zone, inner curve equalized, 1-3 mm. thickness.

Barranca Blanca, Chile. Found 1885. Obz. 17 gr. 4 cm. Alteration-zone of 1-3 mm. thickness.

Oscuro Mountain, New Mexico. Known 1898. Og. 67 gr. 17 cm. Alteration-zone of 0.4-2 mm. thickness.

Ballinoo, Australia. Found 1893. Off. 395 gr. 40 cm. Double alteration-zone, outer zone sparkling, inner dull. Plate V, Fig. 44.

Azucar, Chile. Found 1887. Og. 160 gr. 35 cm. Alter-

ation-zone of 1–8 mm. thickness, terminating at a concavity produced by molten and removed Troilite.

Puquios, Chile. Found 1894. 70 gr. 12 cm. Faulting of octahedral lamellæ.

Bridgewater, North Carolina. Described 1890. Om. 128 gr. 30 cm. Faulting of octahedral lamellæ.

Mukerop (Bethany), Namaland. Found 1899 (1853). 386 gr. 35 cm. Faulting of lamellæ on border-fissures.

Mukerop. 64 gr. 9 cm. Wall-border bent on two sides.

Mukerop. 400 gr. 42 cm. Wall-border bent on one side.

Bella Roca, Mexico. Described 1888. Of. 104 gr. 15 cm. Wall-border bent on one side.

Mukerop. 727 gr. 38 cm. Hexahedral chamfers.

Lime Creek, Alabama. Found 1834. H. 8 gr. 2 cm. Neumann-lines bent.

DeSotoville, Alabama. Found 1878. H. 158 gr. 25 cm. Canted Giant-Rhabdites on curved faulting vein.

Badger, New Mexico. Known 1897. Om. 162 gr. 52 cm. Strong bending of inner octahedral lamellæ.

Smith Mountain, North Carolina. Known 1863. Of. 14 gr. 14 cm. Damascened, violet and blue (Kamacite), pink (Taenite).

Homestead, Iowa. Fell February 12, 1875. Cgb. 62 gr. 11 cm. Gray unchanged mass (48 gr.), green (serpentinized) mass (14 gr.).

Ophir, Montana. Found 1897. Dn. 30 gr. Chips 5–7 cm. long, 0.5–1 mm. thick.

V. WEATHERING, FORMATION OF NEW CONSTITUENTS.

Saline, Kansas. Fell November 15, 1898. Cck. 67 gr. 22 cm. Spots of rust piercing through the crust.

Stålldalen, Sweden. Fell June 28, 1870. Cgb. 37 gr. 9 cm. Limonite formed on a harness-face.

Long Island, Kansas. Found 1892. Cia. 160 gr. 30 cm. Rusted through the whole mass by resting in moist earth.

Amana, Somaliland. Fell July 4, 1889. Ckb. 93 gr. 30 cm. Stratified Limonite crust on the surface.

Amana. 8 gr. 3 cm. Loose stratified Limonite crust.

Mackinney, Kansas. Fell 1870. Cs. 91 gr. 40 cm. Limonite crust on the surface.

Mackiney. 50 gr. Loose Limonite crust.

Orgueil, France. Fell May 14, 1864. K. 33 gr. Weathering grains.

Brenham, Kansas. Found 1885. Pk. 98 gr. 29 cm. Olivines partly fresh, partly limonitized.

Brenham. 187 gr. 36 cm. Olivines browned.

Brenham. 75 gr. Loose limonitized grains as products of weathering.

Mount Dyrning, New South Wales. Known 1902. Pk. 26 gr. 9 cm. Olivines browned, Nickel-iron limonitized, Schreibersite fresh.

Mount Dyrning. 149 gr. 35 cm. Nearly entirely limonitized; weathering in layers; olivines mostly changed into reddish-white substances.

Admire, Kansas. Found 1892. Pr. 244 gr. 20 cm. Weathering-crust 5-10 mm. thick; beginning of falling to pieces by formation of fissures.

Imilac, Chile. Found 1800. Pi. 100 gr. Twenty-three weathering individuals.

Wichita, Texas. Found 1836. Og. 44 gr. 14 cm. Worm-like limonitic rust-figures, free of Bacteria.

Joe Wright, Arkansas. Found 1884. Om. 15 gr. 4 cm. Dividing along the octahedron-faces.

Lipan Flats, Texas. Found 1897. Om. 184 gr. 27 cm. Dividing partly along octahedron-faces, partly curvilinearly.

Tarapaca, Chile. Known 1894. Om. 264 gr. 22 cm. Uncovered (disintegrated) octahedron-faces of 3-4 cm. by weathering on fresh mass.

Ranchito, Mexico. Found 1871. Off. 65 gr. 12 cm. Uncovered octahedron-faces of 2 cm. by weathering on fresh mass.

Cosby's Creek, Tennessee. Found 1837. Og. 37 gr. 6 cm. Uncovered (disintegrated) octahedron with superposed Taenite lamellæ.

Welland, Canada. Found 1888. Om. 11 gr. Uncovered octahedron lamellæ.

Nelson County, Kentucky. Found 1860. Ogg. 261 gr. 40 cm. Octahedral weathering on fresh mass.

Sao Juliao, Portugal. Found 1883. Ogg. 14 gr. Nail formed by weathering.

Mount Joy, Pennsylvania. Found 1887. Ogg. 29 gr. Fallen down in grains of 2-3 cm.

Badger, New Mexico. Known 1897. Om. 5 gr. Grains of Limonite as products of weathering.

Apolonia, Mexico. Found 1897. 40 gr. 12 cm. Changed into Limonite.

Sao Francisco, Brazil. Found 1874. Tell. 343 gr. 28 cm. Penetrating of limonitic alteration in layers.

Sao Francisco. 47 gr. 8 cm. Altered to Hematite.

Sao Francisco. 89 gr. 19 cm. Cellular alteration to Hematite and Limonite.

Augustinowka, Russia. Found 1890. Of. 130 gr. 22 cm. Stratified Limonite-crust of 2-3 cm. thickness.

San Cristobal, Chile. Found 1882. Dl. 5 gr. Whitish limonitic products of alteration.

Vaca Muerta, Chile. Known 1861. Mg. 63 gr. 12 cm. Forming of Nickel sulphates.

Doña Inez, Chile. Found 1888. M. 15 gr. 6 cm. Forming of Nickel sulphates.

VI. CONSTITUENTS OF METEORITES.

Saline, Kansas. Fell November 15, 1898. Cck. 146 gr. 36 cm. Free Phosphorus by opening the interior.

Nowo Urej, Russia. Fell September 22, 1886. U. 14 gr. 6 cm. Diamond as microscopic component, one per cent. of mass.

Carcote, Chile. Known 1888. Ck. Splinters. Diamond as microscopic component.

Badger, New Mexico. Known 1897. Om. 537 gr. 42 cm. Graphite with attached Troilite in form of a **T**, 3 to 4 cm. Plate V, Fig. 45.

Toluca, Mexico. Described 1784. Om. 177 gr. 22 cm. Graphite as layer between nuggets of Troilite and their mantle of Schreibersite.

Senhadja, Algiers. Fell August 25, 1865. Cwa. 145 gr. 20 cm. Crystals of Nickel-iron, partly with cleavage faces, in Troilite; chondrule of 11 mm. diameter with bar.

Vaca Muerta, Chile. Known 1861. Mg. 1 gr. Grain of Nickel-iron with Widmanstätten-figures.

Crab Orchard, Tennessee. Found 1887. Mg. 35 gr. 12 cm. Chondrule of Nickel-iron with Widmanstätten-figures.

Mincy, Missouri. Found 1856. M. 140 gr. 30 cm. Chondrule of Nickel-iron, 2 cm. diameter, with worm-like residues of Silicates.

Morristown, Tennessee. Found 1887. Mg. 101 gr. 35 cm. Chondrules of Nickel-iron, 1-3 cm. diameter, with Silicate grains.

Hainholz, Germany. Found 1856. M. 77 gr. 19 cm. Chondrules of Nickel-iron, 5-10 mm. diameter.

Baratta, New South Wales. Fell May, 1845. Cgb. 58 gr. 18 cm. Chondrules partly with Iron cover, partly with Troilite cover.

Mackinney, Texas. Fell 1870. Cs. 300 gr. 40 cm. Black chondrules with Iron cover.

Marjalathi, Finland. Fell June 1, 1902. Pi. 61 gr. 17 cm. Crystals of Nickel-iron up to 6 mm. diameter, with rounded edges; crystals of Chromite; cylinder of Troilite.

Sao Francisco, Brazil. Found 1874. Tell. 24 gr. 6 cm. Crystals of Nickel-iron with folded faces.

Ovifac, Greenland. Found 1808. Tell. 242 gr. 50 cm. Nickel-iron grains in Basalt.

Ovifac. 225 gr. 42 cm. Chondrules of Nickel-iron in Basalt. Plate VI, Fig. 46.

Ovifac. 176 gr. 40 cm. Veins of Nickel-iron in Basalt.

Coahuila, Mexico. Known 1837. H. 293 gr. 30 cm. Kamacite with hexahedral cleavage.

Cañon Diablo, New Mexico. Found 1891. Og. 118 gr. 20 cm. Consisting of Kamacite.

Toluca, Mexico. Described 1784. Om. 347 gr. 30 cm. Kamacite with hatchings.

Merceditas, Chile. Known 1884. Om. 177 gr. 38 cm. Kamacite with hatchings.

Seeläsgen, Germany. Found 1847. Ogg. 52 gr. 10 cm. Kamacite with strong orientated glitter.

Pila, Mexico. Known 1804. Om. 240 gr. 30 cm. Kamacite sparkling.

Fort Pierre, Missouri. Found 1856. Om. 330 gr. 43 cm. Iron dull.

Plymouth, Indiana. Found 1893. Om. 45 gr. 28 cm. Iron dull.

Nelson County, Kentucky. Found 1860. Ogg. 103 gr. 38 cm. Iron with silky luster.

Walker Township, Michigan. Found 1886. Of. 333 gr. 45 cm. Kamacite banded.

Burlington, New York. Known 1819. Om. 10 gr. 3 cm. Kamacite puffy.

Brenham, Kansas. Found 1885. Pk. 267 gr. 28 cm. Wrapping-Kamacite.

Welland, Canada. Found 1888. Om. 9 gr. Taenites isolated by weathering.

Bella Roca, Mexico. Described 1888. Of. 85 gr. 28 cm. Taenite prevailing.

LaCaille, France. Found 1600. Om. 25 gr. 14 cm. Taenite prevailing beneath sparkling Kamacite and Plessite.

Misteca, Mexico. Described 1804. Om. 128 gr. 42 cm. Taenite with fernlike skeletons.

Thunda, Australia. Described 1886. Om. 49 gr. 9 cm. Taenite strongly developed.

Coopertown, Tennessee. Known 1860. Om. 49 gr. 11 cm. Skeletons of Taenite.

Carlton, Texas. Found 1887. Off. 131 gr. 33 cm. Plessite prevailing.

Mungindi, Australia. Known 1897. Off. 47 gr. 17 cm. Plessite prevailing, with central skeletons.

Thurlow, Canada. Found 1888. Of. 22 gr. 6 cm. Plessite with central skeletons.

Toluca (doubtful). 27 gr. 6 cm. Bridges (bars) through fields and between puffy beams.

Tazewell, Tennessee. Found 1853. Off. 100 gr. 20 cm. Dodecahedral lamellæ beneath octahedral ones.

Bel'a Roca, Mexico. Known 1888. Of. 37 gr. 12 cm. Iron-tongue in Troilite.

San Cristobal, Chile. Found 1882. Db. 301 gr. 35 cm. Shagreen Iron in meandering latticed Iron.

San Cristobal. 29 gr. 2 cm. Gold-yellow crystal in Troilite.

Beaconsfield, Australia. Found 1897. Og. 1 gr. Isolated crystals of Cohenite.

Niakornak, Greenland. Found 1819. Tell. 1 gr. Isolated Cohenite crystals.

Glowed steel with 1.3 per cent. C. Artificial. 1 gr. Isolated Cohenite crystals.

Ruffs Mountain, South Carolina. Known 1850. Om. 47 gr. 12 cm. Ribs of gray Cohenite in Kamacite.

Bendego, Brazil. Found 1784. Og. 148 gr. 25 cm. Cohenite-ribs in Kamacite, porous.

Wichita, Texas. Found 1836. Og. 428 gr. 40 cm. Cohenite ribs with high lustre in Kamacite.

Magura, Hungary. Found 1840. Og. 174 gr. 36 cm. Cohenite ribs in Kamacite, united to skeletons.

Penkarring Rock, Australia. Found 1864. Og. 73 gr. 11 cm. Cohenite ribs and Schreibersite in Kamacite.

Cañon Diablo, New Mexico. Found 1891. Og. 159 gr. 23 cm. Cohenite ribs in Kamacite porous and compact.

Rosario, Honduras. Known 1897. Og. 18 gr. 7 cm. Cohenite lamellæ and skeletons in Kamacite.

Deep Springs Farm, North Carolina. Found 1846. Db. 30 gr. 5 cm. Orientated plates of crystals of Cohenite in dull Iron.

Ovifac, Greenland. Found 1808. Tell. 152 gr. 42 cm. Cohenite forming with Nickel-iron grains in Basalt.

Sao Juliao, Portugal. Found 1883. Ogg. 2 gr. Isolated crystals of Schreibersite, iridescent.

Sao Juliao. 100 gr. Isolated crystals of Schreibersite.

Sao Juliao. 60 gr. 12 cm. Uncovered skeleton of Schreibersite.

Carlton, Texas. Found 1887. Off. 5 gr. Isolated Schreibersite crystals.

Carlton. 277 gr. 31 cm. Crystals of Schreibersite in Wrapping Kamacite in the Trias.

Primitiva, Chile. Found 1888. Dp. 4 gr. Isolated fragments of Schreibersite crystals.

Toluca, Mexico. Described 1784. Om. 119 gr. 13 cm. Crystals of Schreibersite with smooth faces and rounded edges; Graphite.

Saint François, Missouri. Known 1863. Og. 47 gr. 30 cm. Schreibersite ribs in Kamacite.

Bischtube, Russia. Found 1888. Og. 263 gr. 40 cm. Skeleton-like crystals of porous Schreibersite in parallel layers of compact Schreibersite in wrapping-Kamacite in the Trias.

Tennant's Iron. Found 1784. Og. 9 gr. 4 cm. Crystals of Schreibersite in parallel layers of Cohenite beneath free Cohenite crystals.

Dacotah, Indian Territory. Found 1863. Ogg. 90 gr. 35 cm. Hieroglyphic Schreibersite, partly faulted by a fissure.

DeSotoville, Alabama. Found 1878. H. 298 gr. 45 cm. Schreibersite crystals partly turning into Schreibersite hieroglyphs.

DeSotoville. 287 gr. 40 cm. Crystal of Schreibersite in Limonite-Magnetite beneath Schreibersite hieroglyphs and Rhabdite ranges.

San Cristobal, Chile. Found 1882. Dl. 14 gr. 7 cm. Two layers of Schreibersite (compact inward, grainy outward) on Troilite.

San Cristobal. 67 gr. 12 cm. Schreibersite with hatchings in a Troilite crystal.

Ballinoo, Australia. Found 1893. Off. 99 gr. 28 cm. Schreibersite points in Troilite nuggets.

Ballinoo. 8 gr. 8 cm. Three loose Troilite nuggets, partly with crystalline surface, with points of Schreibersite.

Sao Juliao, Portugal. Found 1883. Ogg. 280 gr. 40 cm. Plates of Giant-Rhabdites, 2 cm. long, terminating hieroglyphs of Schreibersite.

Locust Grove, North Carolina. Found 1857. Ds. 206 gr. 38 cm. Rhabdite plates of 5-12 mm., apparently orientated.

Seeläsgen, Germany. Found 1847. Ogg. 20 gr. 5 cm.

Rhabdites abundant in Kamacite; etching zones round Taenites.

Hex River Mounts, Capeland. Found 1882. H. 216 gr. 45 cm. Parallel ranges of diagonal Rhabdites.

DeSotoville, Alabama. Found 1878. H. 266 gr. 43 cm. Parallel ranges of diagonal Rhabdites beneath skeletons of Schreibersite. Plate VI, Fig. 47.

Scottsville, Kentucky. Found 1867. H. 57 gr. 14 cm. Wreath of Rhabdites around Troilite-grain.

Fort Duncan, Texas. Found 1882. H. 99 gr. 24 cm. Inversion of orientated glitter inward and outward of etching zone of Troilites; Neumann-lines traversing; rust figures worm-like.

Floyd Mountain, Virginia. Found 1887. Ha. 400 gr. 40 cm. Spot-ranges and Rhabdite-ranges in parallel planes; Troilite with Cohenite or Schreibersite points.

Butler, Missouri. Found 1874. Off. 5 gr. Isolated Troilites limonitized.

Sao Francisco, Brazil. Found 1874. Tell. 2 gr. 1 cm. Troilite crystals on folded Troilite plates.

Kansada, Kansas. Found 1894. Cib. 194 gr. 25 cm. Troilite nuggets of various forms beneath Nickel-iron grains in Chondrite.

Zavid, Bosnia. Fell August 1, 1897. Cia. 67 gr. 14 cm. Nest of 3 cm. diameter of Troilite grains in Chondrite.

MacKinney, Texas. Fell 1870. Cs. 250 gr. 40 cm. Troilite vein 3-10 mm. thick.

MacKinney. 351 gr. 48 cm. Troilite grains of 3-7 mm. in Chondrite.

Baratta, New South Wales. Fell May, 1845. Cgb. 138 gr. 38 cm. Chondrules with Troilite mantle beneath grains of Troilite and Nickel-iron.

Bella Roca, Mexico. Known 1888. Of. 94 gr. 30 cm. Nuggets of Troilite with wrapping-Kamacite in the Trias.

Mukerop (Bethany), Namaland. Found 1899. (1853.) Of. 363 gr. 41 cm. Nuggets of two kinds of Troilite; the soluble, with fluidal structure interlocking as tongues in the insoluble one.

Mukerop. 489 gr. 45 cm. Nuggets of soluble and insoluble

ble Troilite; Reichenbach lamellæ consisting of bulbous Troilite. Plate VII, Fig. 48.

Lagrange, Kentucky. Found 1860. Of. 29 gr. 18 cm. Reichenbach lamellæ with bent borders, trailed.

Merceditas, Chile. Known 1884. Om. 115 gr. 41 cm. Reichenbach lamellæ originating in Troilite nuggets.

Joe Wright, Arkansas. Found 1884. Om. 135 gr. 40 cm. Reichenbach and Schreibersite lamellæ 2-3 cm. long.

Trenton, Wisconsin. Found 1858. Om. 57 gr. 30 cm. Reichenbach lamellæ 2-3 cm. long.

Primitiva, Chile. Found 1888. Dp. 25 gr. 14 cm. Troilite nuggets with Iron tongues in Nickel-iron, small Troilite globes swarming around, beneath hieroglyphs of Schreibersite.

Sao Julia, Portugal. Found 1883. Ogg. 157 gr. 20 cm. Troilite points in parallel ranges beneath crystals and hieroglyphs of Schreibersite.

Bendego, Brazil. Found 1784. Og. 54 gr. 13 cm. Crystal of Daubréelite with adhering Troilite, 1 cm. diameter.

Santo Domingo Yanhuitlan, Mexico. Known 1804. Of. 42 gr. 36 cm. Oval Troilite nuggets transversed by bands of Daubréelite; Reichenbach lamellæ.

Badger, New Mexico. Known 1897. Om. 434 gr. 33 cm. Daubréelite crystal in Troilite nugget, the whole in wrapping Kamacite, on which stowed the octahedral lamellæ; half detached octahedron.

Shalka, India. Fell November 30, 1850. Chl. 10 gr. 4 cm. Chromite individuals up to 5 mm. diameter, strongly deformed.

Marjalathi, Finland. Fell June 1, 1902. Pi. 192 gr. 30 cm. Crystals of Chromite, uncovered and in section.

Mount Dyrning, New South Wales. Known 1902. Pk. 52 gr. 20 cm. Crystals of Chromite, octahedron, dodecahedron, trapezohedron and two hexakisoctahedra.

Krasnojarsk, Siberia. Found 1749. Pk. 4 gr. Isolated crystals of olivine, olive-green and brown.

Jamyschewa, Siberia. Found 1885. Pk. 2 gr. Isolated olivine crystals.

Brenham, Kansas. Found 1885. Pk. 50 gr. Isolated olivine crystals.

Brenham. 64 gr. 33 cm. Parallel laces of olivine crystals in Nickel-iron.

Estherville, Iowa. Fell May 10, 1879. M. 20 gr. Isolated individual of olivine.

Mincy, Missouri. Found 1856. M. 154 gr. 42 cm. Olivine crystal 5 cm. diameter, in Mesosiderite.

Eagle Station, Kentucky. Found 1880. Pr. 86 gr. 25 cm. Olivine crystals up to 2 cm. diameter, broken, with inserted Nickel-iron between the fragments.

Vaca Muerta, Chile. Found 1861. Mg. Three thin sections of an olivine crystal.

Stannern, Moravia. Fell May 22, 1808. Eu. 130 gr. 25 cm. Vein of Anorthite in normal Eukrite.

New Concord, Ohio. Fell March 1, 1860, Cia. 74 gr. 15 cm. Grains of Anorthite in Chondrite.

Toluca, Mexico. Found 1784. Om. Microscopic preparation of crystals of Kosmochlore.

Saint Caprais, France. Fell January 28, 1883. Ci. 1 gr. 1 cm. Greenish-yellow crystals of Enstatite.

Fisher, Minnesota. Fell April 9, 1894. Cia. 10 gr. 6 cm. Foliated chondrule of Enstatite, 1 cm. diameter.

Hvittis, Finland. Fell October 21, 1901. Cek. 11 gr. 3 cm. Enstatite chondrule, 1 cm. diameter.

Alfanello, Italy. Fell February 16, 1883. Ci. 36 gr. 12 cm. Chondrules black, gray and striated (black and white).

Zavid, Bosnia. Fell August 1, 1897. Cia. 24 gr. 7 cm. Greenish-gray, fragmentary chondrule of 1 cm. diameter in Chondrite.

Zavid. 71 gr. 12 cm. Dark gray chondrule with white, cruciform skeleton.

Antifona, Italy. Fell February 3, 1890, Cc. 2 gr. 3 cm. White chondrule with blue nucleus.

Kaande, Russia. Fell May 11, 1855. Cw. 12 gr. 4 cm. White chondrule of 5 mm. diameter.

Bath, Dakota. Fell August 29, 1892. Ccb. 18 gr. 5 cm. Radiated chondrule of white and dark gray sectors with black mantle.

Chantonay, France. Fell August 5, 1812. Cgb. 176 gr. 35 cm. Chondrule of 1 cm. diameter, reticulated hexagonally.

Bjurböle, Finland. Fell March 12, 1899. Cca. 128 gr. 20 cm. Gray, oval chondrule of 1 to 1.3 cm. diameter; iridescent Troilite.

Bjurböle. 5 gr. Isolated chondrules.

Allegan, Michigan. Fell July 10, 1899. Cco. 7 gr. Isolated chondrules with drusy surface.

MacKinney, Texas. Fell 1870. Cs. 301 gr. 38 cm. Olive-green, black and Troilite-bearing chondrules up to 1 cm. diameter.

MacKinney. 280 gr. 40 cm. Leek-green cross-chondrules, 1 cm. diameter.

MacKinney. 260 gr. 38 cm. Dull black, rectangular crystalline inclusion.

MacKinney. 300 gr. 42 cm. Yellow and glassy chondrules.

Baratta, New South Wales. Fell May, 1845. Cgb. 214 gr. 40 cm. Chondrule with black and white faulted halves; black glassy chondrules partly with Nickel-iron, partly with Troilite mantle.

Baratta. 196 gr. 42 cm. White, gray, yellow chondrules and black glassy chondrules.

Baratta. 159 gr. 39 cm. Radiated Troilite-bearing chondrule with Iron mantle; fragmentary chondrules.

Manbhoom, India. Fell December 22, 1863. Am. 3 gr. 2 cm. Nugget of crystalline Chondrite Ck, isolated from Amphoterite.

Netschajevo, Russia. Found 1846. Obn. 20 gr. 5 cm. Nugget of veined crystalline Chondrite Cka, isolated from Octahedrite.

Devitrified molten pitchstone in the form of a radiated globe with adhering fragments of glass; 6 cm. diameter.

VII. SYSTEM OF METEORITES.¹

STONES—SILICATES PREVAILING.

A. ACHONDRITES.—Stones poor in Nickel-iron, essentially without round chondrules.

¹ All groups are defined, whether represented in the collection or not. The weights and Roman numbers in parentheses, *e. g.*, Shalka (10 gr. VI), refer to specimens listed in foregoing sections (VI constituents, etc.).

1. *Chladnite*, Chl. Chiefly Bronzite.
Shalka, India. Fell November 30, 1850. (10 gr., VI.)
Ibbenbüren, Germany. Fell June 17, 1870. 4 gr. 3 cm.
 2. *Veined Chladnite*, Chla. Bronzite with black or metallic veins.
 3. *Angrite*, A. Chiefly Augite.
 4. *Chassignite*, Cha. Chiefly Olivine.
Chassigny, France. Fell October 3, 1815, Spl. 1 cm.
 5. *Bustite*, Bu. Bronzite with Augite.
 6. *Amphoterite*, Am. Bronzite with Olivine.
Manbhoom, India. Fell December 22, 1863. 219 gr. 30 cm. Three sections. (3 gr., VI.)
Jelica, Servia. Fell December 1, 1889. 126 gr. 25 cm. Seven sections.
 7. *Rodite*, Ro. Bronzite with Olivine, breccia-like.
Bandong, Java. Fell December 10, 1871. 46 gr. 9 cm.
 8. *Eukrite*, Eu. Augite with Anorthite.
Constantinople, Turkey. Fell June, 1805. Spl.
Stannern, Moravia. Fell June 22, 1808. Two sections. (162 gr., IV; 130 gr., VI.)
Juvinas, France. Fell June 15, 1821. (21 gr., IV.)
 9. *Shergottite*, She. Augite with Maskelynite.
 10. *Howardite*, Ho. Bronzite, Olivine, Augite and Anorthite.
La Vivionnière, France. Fell July 14, 1845. Spl.
Zmen, Russia. Fell August, 1858. Spl.
 11. *Breccia-like Howardite*, Hob. Bronzite, Olivine, Augite and Anorthite, breccia-like.
 12. *Leucituranolite*, L. Leucite, Anorthite, Augite and glass.
- B.—CHONDRITES.—Bronzite, Olivine and Nickel-iron, with round or round and polyhedral chondrules.
13. *Howarditic Chondrite*, Cho. Polyhedral secretions prevailing, round chondrules scarce. Crust partly bright.
Borgo San Donino, Italy. Fell April 19, 1808. Two thin sections.
Krähenberg, Germany. Fell April 5, 1869. 2 gr. 1 cm.
Ottawa, Kansas. Fell April 9, 1876. 65 gr. 12 cm. One section.

14. *Veined Howarditic Chondrite*, Choa. Polyhedric secretions prevailing, round chondrules scarce. Black or metallic veins.

15. *White Chondrite*, Cw. White, rather friable mass with scarce, mostly white chondrules.

Mordvinovka, Russia. Prehistoric. (1 gr., II.)

Mauerkirchen, Upper Austria. Fell November 20, 1768. 3 gr. 2 cm.

Linum, Germany. Fell September 5, 1854. Spl. 1 cm.

Kaande, Livland. Fell May 11, 1855. 7 gr. 4 cm. (12 gr., VI.)

Tourinnes, Belgium. Fell December 7, 1863. 16 gr. 5 cm.

San Pedro Springs, Texas. Found 1887. 4 gr. 2 cm.

Pricetown, Ohio. Fell February 13, 1893. 2 gr. 1 cm.

16. *Veined White Chondrite*, Cwa. White, rather friable mass with scarce, mostly white chondrules; black or metallic veins.

Lucé, France. Fell September 13, 1768. Two thin sections.

Wold Cottage, England. Fell December 13, 1795. Spl.

Kuleschowka, Russia. Fell March 12, 1811. 1 gr. 1 cm.

Honolulu, Hawaii. Fell November 27, 1825. 6 gr. 3 cm.

Drake Creek, Tennessee. Fell May 9, 1827. 2 gr. 1 cm.

Aumières, France. Fell June 3, 1842. (36 gr., IV.)

Schönenberg, Bavaria. Fell December 25, 1896. 7 gr. 2 cm.

Marion, Iowa. Fell February 25, 1847. 40 gr. 9 cm.

Girgenti, Italy. Fell February 10, 1853. (132 gr., IV.)

Scheikahr, Curland. Fell June 2, 1863. 66 gr. 30 cm.

Senhadja, Algiers. Fell August 25, 1865. (145 gr., VI.)

Grossliebenthal, Russia. Fell November 19, 1881. 79 gr. 16 cm.

Mócs, Hungary. Fell February 3, 1882. Thirty thin sections. (141 gr., IV.)

17. *Breccia-like White Chondrite*, Cwb. White, rather friable mass with scarce, mostly white chondrules; breccia-like.

Lissa, Bohemia. Fell September 3, 1808. 3 gr. 3 cm.

Aleppo, Turkey. Found 1873. (67 gr., IV.)

Pacula, Mexico. Fell June 18, 1881. 2 gr. 3 cm.

18. *Intermediate Chondrite*, Ci. Firm, polishable mass with white and gray chondrules breaking with matrix

Dhurmsala, India. Fell July 14, 1860. (257 gr., IV.)

Rakowka, Russia. Fell November 20, 1878. 130 gr. 30 cm.

Saint Caprais, France. Fell January 28, 1883. (1 gr., VI.)

Alfianello, Italy. Fell February 16, 1883. 286 gr. 38 cm. (36 gr., VI.)

19. *Veined Intermediate Chondrite*, Cia, Firm, polishable mass with white and gray chondrules breaking with the matrix; black or metallic veins.

Berlanguillas, Spain. Fell July 8, 1811. 1 gr. 1 cm.

Durala, India. Fell February 18, 1815. 37 gr. 8 cm.

Vouillé, France. Fell May 13, 1831. 31 gr. 7 cm.

Maçao, Brazil. Fell November 11, 1836. 3 gr. 2 cm.

Château-Renard, France. Fell June 12, 1841. 307 gr. 33 cm. (80 gr., IV.)

Mainz, Germany. Found 1852. 26 gr. 6 cm.

New Concord, Ohio. Fell May 1, 1860. (74 gr., VI.)

Nerft, Curland. Fell April 12, 1864. 98 gr. 20 cm.

Maêmê, Japan. Fell November 10, 1886. (97 gr., IV.)

Long Island, Kansas. Found 1892. 173 gr. 35 cm. (160 gr., V.)

Zabrodje, Russia. Fell September 22, 1893. 4 gr. 3 cm.

Fisher, Minnesota. Fell April 9, 1894. (208 gr., IV; 10 gr. VI.)

Bori, India. Fell May 9, 1894. 12 gr. 5 cm.

Lançon, France. Fell June 20, 1897. 1 gr. 1 cm.

Zavid, Bosnia. Fell August 1, 1897. 147 gr. 36 cm. Four sections. (310 gr., IV; 162 gr., VI.)

Gambat, India. Fell September 15, 1897. 1 gr. 1 cm.

Bath Furnace, Kentucky. Fell November 15, 1902. 5 gr. 3 cm.

20. *Breccialike Intermediate Chondrite*, Cib. Firm, polishable mass, white and gray chondrules breaking with matrix; breccialike.

Laigle, France. Fell April 26, 1803. 47 gr. 12 cm. Four sections. (115 gr., II.)

Saint Mesmin, France. Fell May 30, 1866. 8 gr. 4 cm.

Laborel, France. Fell June 14, 1871. 3 gr. 2 cm.

Bjelokrynitschie, Russia. Fell January 1, 1887. 7 gr. 5 cm.

Kansada, Kansas. Found 1894. 25 gr. 9 cm. (135 gr., IV; 194 gr., VI.)

21. *Gray Chondrite*, Cg. Firm, gray mass, chondrules of various kinds breaking with matrix.

Knyahinya, Hungary. Fell June 9, 1866. Eight thin sections. (423 gr., IV.)

22. *Veined Gray Chondrite*, Cga. Firm, gray mass, chondrules of various kinds breaking with matrix; black or metallic veins.

Barbotan, France. Fell July 24, 1890. (9 gr., II.)

Charsonville, France. Fell November 23, 1810. 153 gr. 22 cm.

Lasdany, Russia. Fell July 12, 1820. (77 gr., IV.)

Parnallee, India. Fell February 28, 1857. 40 gr. 11 cm.

Alessandria, Italy. Fell February 2, 1860. 137 gr. 20 cm. (15 gr., IV.)

Lerici, Italy. Fell January 30, 1868. (6 gr., III.)

Kerilis, France. Fell November 26, 1874. 39 gr., 14 cm.

Cronstadt, Orange River Free State. Fell November 19, 1877. Spl. 1 cm.

23. *Breccialike Gray Chondrite*, Cgb. Firm, gray mass, chondrules of various kinds breaking with matrix; breccialike.

Chantonay, France. Fell August 5, 1812. One thin section. (89 gr., IV; 176 gr., VI.)

Borodino, Russia. Fell September 5-6, 1812. (5 gr., II.)

Baratta, New South Wales. Fell May, 1845. (45 gr., IV; 765 gr., VI.)

Mező-Madarasz, Hungary. Fell September 4, 1852. 67 gr. 14 cm.

Elgueras, Spain. Fell December 6, 1866. 16 gr. 6 cm.

Pultusk, Russia. Fell January 30, 1868. Four sections. (57 gr., III; 639 gr., IV.)

Homestead, Iowa. Fell February 12, 1875. (62 gr., IV.)

Ställdalen, Sweden. Fell June 28, 1876. (34 gr., IV; 37 gr., V.)

Midt Vaage, Norway. Fell May 20, 1884. 1 gr., 1 cm.

24. *Orvinite*, Co. Black infiltrated mass, fluidal texture; surface uneven, crust interrupted.

Orvinio, Italy. Fell August 31, 1872. 1 gr. 1 cm. One section. (30 gr., IV.)

25. *Tadjerite*, Ct. Black, half-glassy, crust-like mass without crust on surface.

26. *Black Chondrite*, Cs. Dark or black mass, chondrules of various kinds breaking with matrix.

Mikenskoi, Russia. Fell June 28, 1861. 2 gr. 2 cm. Two sections.

MacKinney, Kansas. Fell 1870. 243 gr. 45 cm. Five sections. (141 gr., V; 2002 gr., VI.)

Sevrufkof, Russia. Fell May 11, 1874. 19 gr. 8 cm.

Tschuwasschkaja, Russia. Found 1898. 15 gr. 7 cm.

27. *Veined Black Chondrite*, Csa. Dark or black mass, chondrules of various kinds, breaking with matrix; black or metallic veins.

Farmington, Texas. Fell June 25, 1890. 68 gr. 14 cm. Two sections.

28. *Ureilite*, U. Black mass, chondritic or granular; Iron in veins or incoherent.

Nowo Urej, Russia. Fell September 22, 1886. (14 gr., VI.)

29. *Coaly Chondrite*, K. Dull black, friable chondrite with free carbon, low specific gravity, metallic Iron nearly or wholly wanting.

Cold Bokkeveld, Cape Colony. Fell October 13, 1838. 2 gr. 1 cm. One section.

Orgueil, France. Fell May 14, 1864. 6 gr. 5 cm. (33 gr., V.)

Nogoya, Argentina. Fell July 1, 1879. 1 gr., 1 cm.

Mighei, Russia. Fell June 18, 1889. 12 gr. 4 cm.

30. *Globular Coaly Chondrite*, Kc. Dull gray or black, friable mass with free carbon; chondrules not breaking with matrix; metallic Nickel-iron.

31. *Veined Globular Coaly Chondrite*, Kca. Dull black firm mass with free carbon; chondrules not breaking with matrix; metallic veins.

Indarch, Russia. Fell April 7, 1891. 136 gr. 16 cm.

32. *Globular Chondrite*, Cc. Friable mass with hard (radiated) chondrules not breaking with matrix.

Albareto, Italy. Fell July 1766. (3 gr., II; Spl. IV.)

La Baffe, France. Fell September 13, 1822. 2 gr. 1 cm.

Praskoles, Bohemia. Fell October 14, 1824. 11 gr. 5 cm.

Le Pressoir, France. Fell January 25, 1845. 10 gr. 4 cm.

Yatoor, India. Fell January 23, 1852. 77 gr. 16 cm.

Avilez, Mexico. Fell June, 1856. 5 gr. 2 cm.

Quenggouk, India. Fell December 27, 1857. 65 gr. 12 cm.

Aussun, France. Fell December 9, 1858. 110 gr. 17 cm.

Motta di Conti, Italy. Fell February 29, 1868. 33 gr. 10 cm.

Hessle, Sweden. Fell January 1, 1869. 132 gr. 24 cm. (23 gr., IV.)

Sarbanovac, Servia. Fell October 13, 1877. 1 gr. Two sections.

Tieschitz, Bohemia. Fell July 15, 1878. 3 gr. 1 cm. Three sections.

Gnadenfrei, Germany. Fell May 17, 1879. 1 gr. 1 cm.

Torre, Italy. Fell May 24, 1886. 3 gr. 2 cm.

Antifona, Italy. Fell February 3, 1890. 232 gr. 33 cm. (241 gr., IV; 2 gr., VI.)

Misshof, Curland. Fell April 10, 1890. 69 gr. 11 cm.

Mount Browne, New South Wales. Fell July 17, 1902. 81 gr. 25 cm.

33. *Veined Globular Chondrite*, Cca. Friable mass with hard (radiated) chondrules not breaking with matrix; black or metallic veins.

Trenzano, Italy. Fell November 12, 1856. 171 gr. 22 cm.

Bjurböle, Finland. Fell March 12, 1899. 199 gr. 32 cm. (61 gr., II; 133 gr., VI.)

34. *Breccia-like Globular Chondrite*, Ccb. Friable, breccia-like mass with hard (radiated) chondrules not breaking with matrix.

Krawin, Bohemia. Fell July 3, 1753. 6 gr. 3 cm.

Weston, Connecticut. Fell December 14, 1807. 23 gr. 4 cm.

Mooresfort, Ireland. Fell August, 1810. 14 gr. 6 cm.

Cereseto, Italy. Fell July 17, 1840. 1 gr. 1 cm.

Kesen, Japan. Fell May 13, 1850. (8 gr., II.)

Gnarrenburg, Germany. Fell May 13, 1855. Spl.

Waconda, Kansas. Found 1874. 35 gr. 11 cm.

Ochansk, Russia. Fell August 30, 1887. 95 gr. 16 cm.,
16 gr. 5 cm. (12 gr., IV.)

Forest, Iowa. Fell May 2, 1890. Nine sections (83 gr.,
IV.)

Bath, Dakota. Fell August 29, 1892. 300 gr. 40 cm.
(18 gr., VI.)

35. *Ornansite*, Cco. Friable mass of chondrules.

Ornans, France. Fell July 11, 1868. 1 gr. 1 cm.

Warrenton, Missouri. Fell January 3, 1877. 15 gr. 7 cm

Allegan, Michigan. Fell July 10, 1899. 232 gr. 35 cm.
(7 gr., VI.)

36. *Ngawite*, Ccn. Friable breccialike mass of chondrules.

37. *Crystalline Globular Chondrite*, Cck. Hardly friable,
crystalline mass with hard (radiated) chondrules, partly break-
ing with matrix, partly not.

Menow, Germany. Fell October 7, 1862. 7 gr. 4 cm.

Prairie Dog, Kansas. Found 1893. 96 gr. 16 cm.

Beaver Creek, British Columbia. Fell May 26, 1893. 36
gr. 8 cm.

Sawtschenskoje, Russia. Fell July 27, 1894. 22 gr. 9 cm.

Ambapur, India. Fell May 27, 1895. 22 gr. 9 cm. Two
sections.

Saline, Kansas. Fell September 15, 1898. Four sections.
(67 gr., V; 146 gr., VI.)

Chervettaz, Switzerland. Fell November 30, 1901. 32 gr.
8 cm.

38. *Veined Crystalline Globular Chondrite*, Ccka. Hardly
friable, crystalline, veined mass with hard (radiated) chon-
drules partly breaking with matrix, partly not.

39. *Breccia-like Crystalline Globular Chondrite*, Cckb. Hardly
friable, crystalline, breccia-like mass with hard (radiated)
chondrules partly breaking with matrix, partly not.

40. *Crystalline Chondrite*, Ck. Hard crystalline mass with
hard (radiated) chondrules breaking with matrix.

Pillistfer, Livland. Fell August 8, 1863. 187 gr. 33 cm.
Two sections.

Tjabé, Java. Fell September 19, 1869. Two sections.

Alastoewa, Java. Fell March 19, 1884. 1 gr. 2 cm.

Carcote, Chile. Found 1888. (Spl. VI.)

Gilgoi, New South Wales. Described 1889. 7 gr. 3 cm.

Guareña, Spain. Fell July 20, 1892. 5 gr. 3 cm.

Oakley, Kansas. Found 1895. 195 gr. 38 cm.

41. *Veined Crystalline Chondrite*, Cka. Hard crystalline veined mass with hard (radiated) chondrules breaking with matrix.

Kernouvé, France. Fell May 22, 1869. 122 gr. 28 cm. (173 gr., IV.)

Pipe Creek, Texas. Found 1887. 87 gr. 31 cm.

42. *Breccialike Crystalline Chondrite*, Ckb. Hard, crystalline breccialike mass with hard (radiated) chondrules breaking with matrix.

Ensisheim, Germany. Fell November 16, 1492. (10 gr., II.)

Bluff, Texas. Found 1878. 258 gr. 42 cm. Four sections.

Amana, Somaliland. Fell July 4, 1889. 174 gr. 36 cm. (101 gr., V.)

C. ENSTATITE-ANORTHITE-CHONDRITE. Enstatite, Anorthite and Nickel-iron with round chondrules.

43. *Crystalline Enstatite-anorthite Chondrite*, Cek. Hard crystalline mass with hard (radiated) chondrules.

Hvittis, Finland. Fell October 21, 1901. 87 gr. 32 cm. (11 gr., VI.)

D. SIDEROLITE.—Transitions of stones to irons. Nickel-iron in the mass cohering, on sections separated.

44. *Mesosiderite*, M. Crystalline Olivine and Bronzite.

Hainholz, Germany. Found 1856. (77 gr., VI.)

Mincy, Missouri. Found 1856. 100 gr. 23 cm. (294 gr. VI.)

Estherville, Iowa. Fell May 10, 1879. 121 gr. 15 cm. (40 gr., IV; 20 gr., VI.)

Karand, Persia. Fell May, 1880. 26 gr. 10 cm.

Inca, Chile. Known 1888. 41 gr. 8 cm.

Doña Inez, Chile. Known 1888. 54 gr. 12 cm. Four sections. (15 gr., V.)

45. *Grahamite*, Mg. Crystalline Olivine, Bronzite and Plagioclase.

Vaca Muerta, Chile. Known 1861. 46 gr. 14 cm. 12 sections. (184 gr., III; 63 gr., V; 4 gr., VI.)

Crab Orchard, Tennessee. Found 1887. 88 gr. 28 cm. (35 gr., VI.)

Morristown, Tennessee. Found 1887. (101 gr., VI.)

46. *Lodranite*, Lo. Granular-crystalline Olivine and Bronzite.

IRON-METEORITES. METALLIC CONSTITUENTS PREVAILING
OR ALONE.

E. *LITHOSIDERITE*.—Transition from stones to irons; Nickel-iron cohering in mass and on sections.

47. *Siderophyre*, Si. Grains of Bronzite with accessory Asmanite in the Trias.

Rittersgrün (Steinbach), Saxony. Found 1843 (1724). 30 gr. 12 cm.

48. *Pallasite-Krasnojarskgroup*, Pk. Rounded crystals of Olivine in the Trias.

Krasnojarsk, Siberia. Found 1749. (25 gr., II; 4 gr., VI.)

Mount Vernon, Kentucky. Found 1868. 300 gr., 42 cm.

Glorietta, New Mexico. Found 1884. (119 gr., III; 492 gr., IV.)

Brenham, Kansas. Found 1885. (359 gr., III; 360 gr., V; 350 gr., VI.)

Jamyschewa, Siberia. Found 1885. 10 gr. 4 cm (2 gr., VI.)

Finmarken, Norway. Found 1902. 250 gr., 40 cm.

Mount Dyrning, New South Wales. Known 1902. (175 gr., V; 52 gr., VI.)

49. *Pallasite-Rokičky group*, Pr. Polyhedral crystals of Olivine partly broken, and fragments separated by Nickel-iron. Eagle, Kentucky. Found 1880. (86 gr., VI.)

Admire, Kansas. Found 1892. 74 gr. 22 cm. (244 gr., V.)

50. *Pallasite-Imilac group*, Pi. Olivine crystals cracked and squeezed.

Imilac, Chile. Found 1800. 89 gr., 12 cm. (100 gr. V.)

Marjalathi, Finland. Fell June 1, 1902. 259 gr. 33 cm. (147 gr., IV; 253 gr., VI.)

51. *Pallasite-Albach group*, Pa. Olivine crystals in fine brecciated Trias.

F. OCTAHEDRITE.—Kamacite, Taenite and Plessite (Trias), in lamellæ and concamerations of the four octahedron faces.

52. *Finest Octahedrite*, Off. Lamellæ up to 0.2 mm. thickness. Fields prevailing on lamellæ.

Tazewell, Tennessee. Found 1853. (100 gr., VI.)

Ranchito, Mexico. Found 1871. (65 gr., V.)

Butler, Missouri. Found 1874. (5 gr., VI.)

Carlton, Texas. Found 1887. (147 gr., IV; 413 gr., VI.)

Ballinoo, Australia. Found 1893. (395 gr., IV; 107 gr., VI.)

Mungindi, New South Wales. Known 1897. (47 gr., VI.)

53. *Fine Octahedrite Victoria group*, Ofv. Lamellæ of Troilite and Schreibersite in fine Trias.

54. *Fine Octahedrite*, Of. Thickness of lamellæ 0.2–0.4 mm.

Santo Domingo Yanhuitlan (Teposcolula), Mexico. Known 1804. (42 gr., VI.)

Putnam, Georgia. Found 1839. 22 gr., 5 cm.

Bethany (Mukerop, Lion River), Namaland. Found 1853. (1204 gr., III; 1927 gr., IV; 872 gr., VI.)

Jewell Hill, North Carolina. Known 1854. 14 gr. 4 cm.

Lagrange, Kentucky. Found 1860. (29 gr., VI.)

Smith Mountain, North Carolina. Known 1863. (14 gr., IV.)

Bückeberg, Germany. Found 1863. 12 gr. 3 cm.

Walker Township, Michigan. Found 1883. (333 gr., VI.)

Jamestown, Dacotah. Found 1885. (69 gr., IV.)

Bella Roca, Mexico. Known 1888. 82 gr. 28 cm. (104 gr., IV; 216 gr., VI.)

Saint Genevieve, Missouri. Found 1888. 313 gr. 45 cm.

ThurLOW, Canada. Found 1888. (22 gr., VI.)

Cuernavaca, Mexico. Described 1889. 5 gr. 4 cm.

Apoala, Mexico. Found 1890. 5 gr. 1 cm.

Augustinowka, Russia. Found 1890. 39 gr. 9 cm. (130 gr., V.)

55. *Mollified Fine Octahedrite*, Ofe. Figures fallen in disorder by mollifying; points instead of Troilite lamellæ.

56. *Medium Octahedrite*, Om. Thickness of lamellæ 0.5-1 mm.

Casas Grandes, Mexico. Prehistoric. (102 gr., II.)

Elbogen, Bohemia. Known 1400. (12 gr., II.)

LaCaille, France. Known 1600. (25 gr., VI.)

Adargas, Mexico. Known 1780. 135 gr. 24 cm.

Descubridora, Mexico. Known 1783. 88 gr. 20 cm.

Toluca, Mexico. Described 1784. (660 gr., VI.)

Misteca, Mexico. Described 1784. (128 gr., VI.)

Pila, Mexico. Known 1784. (240 gr., VI.)

Burlington, New York. Known 1819. (10 gr., VI.)

Carthage, Tennessee. Found 1840. 12 gr. 3 cm.

Ruffs Mountain, South Carolina. Described 1850. (47 gr., VI.)

Fort Pierre, Nebraska. Found 1856. (330 gr., VI.)

Staunton IV, Virginia. Found 1858. 51 gr. 18 cm.

Trenton, Wisconsin. Found 1858. (57 gr., VI.)

Coopertown, Tennessee. Known 1860. (49 gr., VI.)

Nejed, Arabia. Found 1864. 25 gr. 11 cm.

Caperr, Patagonia. Known 1869. 6 gr. 2 cm.

Merceditas, Chile. Known 1884. (292 gr., VI.)

Joe Wright, Arkansas. Found 1884. (15 gr., V; 135 gr., VI.)

Puquios, Chile. Found 1885. (70 gr., IV.)

Mazapil, Mexico. Fell November 27, 1885. (11 gr., II.)

Thunda, Queensland. Described 1886. (49 gr., VI.)

Tonganoxie, Kansas. Found 1886. 40 gr. 25 cm.

Algoma, Wisconsin. Found 1887. 13 gr., 8 cm.

Welland, Canada. Found 1888. 85 gr. 25 cm. (11 gr., V; 9 gr., VI.)

Independence, Kentucky. Found 1889. 305 gr. 42 cm.

Bridgewater, North Carolina. Described 1890. (128 gr., IV.)

Hammersley, Australia. Found 1892. (119 gr., IV.)

Oroville, California. Known 1893. 18 gr. 3 cm.

Plymouth, Indiana. Found 1893. (45 gr., VI.)

El Capitan, New Mexico. Found 1893. 60 gr. 13 cm.

- Tarapaca, Chile. Known 1894. (264 gr., V.)
Arlington, Minnesota. Found 1894. (28 gr., IV.)
Nocoleche, New South Wales. Found 1895. 84 gr. 20 cm.
Luis Lopez, New Mexico. Found 1896. 34 gr. 6 cm.
Badger, New Mexico. Known 1897. 17 gr. 5 cm. (1050 gr., IV; 5 gr., V; 971 gr., VI.)
Lipan Flats, Texas. Found 1897. (184 gr., V.)
57. *Mollified Medium Octahedrite*, Ome. Figures fallen in disorder by mollifying; points instead of Taenite lamellæ.
58. *Coarse Octahedrites*, Og. Thickness of lamellæ 1.5–2.0 mm.
Tennant's Iron. Found 1784. (7 gr., VI.)
Bendego, Brazil. Found 1784. (202 gr., VI.)
Bohumilitz, Bohemia. Found 1829. 54 gr. 6 cm.
Wichita, Texas. Found 1836. (168 gr., II: 44 gr., V; 428 gr., VI.)
Cosby's Creek, Tennessee. Found 1837. 22 gr. 5 cm. (37 gr., V.)
Smithville, Tennessee. Found 1840. 39 gr. 7 cm.
Magura, Hungary. Found 1840. (174 gr., VI.)
Cranbourne, Victoria. Found 1854. (1 gr., VI.)
Sarepta, Russia. Found 1854. (19 gr., IV.)
Saint François, Missouri. Known 1863. (47 gr., VI.)
Canyon City, California. Found 1872. 100 gr., 12 cm.
Nochtuisk, Siberia. Found 1876. 1 gr. 1 cm.
Penkarring Rock, Australia. Found 1884. (2 gr., IV; 73 gr., VI.)
Silver Crown, Wyoming. Found 1887. (133 gr., IV.)
Azucar, Chile. Found 1887. (160 gr., IV.)
Bischtube, Russia. Found 1888. (263 gr., VI.)
Cañon Diablo, New Mexico. Found 1891. (173 gr., IV; 272 gr., VI.)
Oscuro Mountain, New Mexico. Found 1895. (67 gr., IV.)
Rosario, Honduras. Known 1897. (18 gr., VI.)
59. *Mollified Coarse Octahedrite*, Oge. Figures fallen in disorder by mollifying; points instead of Taenite lamellæ.
Reed City, Michigan. Found 1895. (122 gr., IV.)
60. *Coarsest Octahedrite*, Ogg. Thickness of lamellæ 2.5 mm. and more.

Seeläsgen, Germany. Found 1847. (72 gr., VI.)

Union County, Georgia. Described 1853. 11 gr. 3 cm.

Nelson County, Kentucky. Found 1860. (261 gr., V; 103 gr., VI.)

Dacotah, Indian Territory. Found 1863. (90 gr., VI.)

Sao Juliao, Portugal. Found 1883. 275 gr. 48 cm. (493 gr., V; 599 gr., VI.)

Mount Joy, Pennsylvania. Found 1887. 57 gr. 7 cm. (29 gr., V.)

Mooranoppin, Australia. Known 1893. 26 gr. 14 cm.

Arispe, Mexico. Found 1898. 19 gr. 3 cm.

61. *Breccia-like Octahedrite, Netschajevo group*, Obn. Medium Octahedrite with nuggets of Silicate.

Netschajevo, Russia. Found 1846. 38 gr. 10 cm. (20 gr., VI.)

62. *Breccia-like Octahedrite Kodaikanal group*, Obk. Fine Octahedrite brecciated with nuggets of Silicate.

63. *Breccia-like Octahedrite Copiapo group*, Obc. Coarsest Octahedrite brecciated with Silicate-nuggets.

Copiapo, Chile. Found 1863. 4 gr. 2 cm.

64. *Breccia-like Octahedrite Zacatecas group*, Obz. Octahedral nuggets breccialike with globes of Troilite.

Zacatecas, Mexico. Known 1520. 30 gr. 10 cm.

Barranca Blanca, Chile. Found 1855. (17 gr., IV.)

65. *Breccia-like Octahedrite Ngoureyima group*, Obzg. Molten and tracted Iron of the Zacatecas group.

Ngoureyima, Algiers. Fell June 15, 1900. 173 gr. 40 cm. (29 gr., IV.)

G. HEXAHEDRITE.—Structure and cleavage hexahedral.

66. *Normal Hexahedrite*. Neumann-lines ungrained.

Lime Creek, Alabama. Found 1834. (8 gr., IV.)

Coahuila, Mexico. Known 1837. (293 gr., VI.)

Fort Duncan, Texas. Known 1852. 183 gr. 45 cm. (99 gr., VI.)

Scottsville, Kentucky. Found 1867. (57 gr., VI.)

DeSotoville, Alabama. Found 1878. (158 gr., IV; 851 gr., VI.)

Hex River, Cape Colony. Found 1882 (216 gr., VI.)

Iredell, Texas. Found 1898. 6 gr. 4 cm.

Murphy, North Carolina. Found 1899. 43 gr., 13 cm.

67. *Grained Hexahedrite*, Ha. Structure and cleavage running through the whole mass consisting of grains with differently orientated sparkling.

Floyd Mountain, Virginia. Found 1887. (400 gr., VI.)

68. *Brecciated Hexahedrite*, Hb. Mass consisting of differently orientated hexahedral grains.

Kendall County, Texas. Known 1887. 299 gr. 41 cm.

H. ATAXITE.—Structure interrupted.

69. *Capegroup*, Dc. Rich in Nickel; sharp (hexahedral?) etching bands in dull mass.

70. *Shingle Springs group*, Dsh. Rich in Nickel; not sharp parallel spots.

71. *Babbsmill group*, Db. Rich in Nickel; lusterless, homogeneous mass.

Deep Springs, North Carolina. Found 1846. (30 gr., VI.)

72. *Linnville group*, Dl. Rich in Nickel; meandering-veined or latticed.

San Cristobal, Chile. Found 1882. (5 gr., V; 411 gr., VI.)

Ternera, Chile. Described 1891. 1 gr. 1 cm.

73. *Nedagolla group*, Dn. Poor in Nickel, grained, no ridges.

Rafrüti, Switzerland. Fell October, 1856. 1 gr. 1 cm.

Forsyth County, Georgia. Found 1891. 221 gr. 37 cm.

Ophir, Montana. Found 1897. 55 gr. 30 cm. (30 gr., IV.)

74. *Siratic group*, Ds. Poor in Nickel; ridges, incisions or enveloped Rhabdites.

Campo del Cielo, Argentina. Found 1873. 8 gr. 2 cm.

Chesterville, South Carolina. Found 1847. 12 gr. 6 cm.

Locust Grove, Georgia. Found 1857. (206 gr., VI.)

75. *Primitiva group*, Dp. Poor in Nickel; silky streaks and luster.

Primitiva, Chile. Found 1888. 306 gr. 44 cm. (29 gr., VI.) Plate VII, Fig. 49.

76. *Muchachos group*, Dm. Poor in Nickel, grained, porphyritic with Forsterite.

Telluric Iron, Tell.

Ovifac, Disco, Greenland. Found 1808. (795 gr., VI.)







BREZINA—METEORITES.



FIG. 42.



FIG. 43.

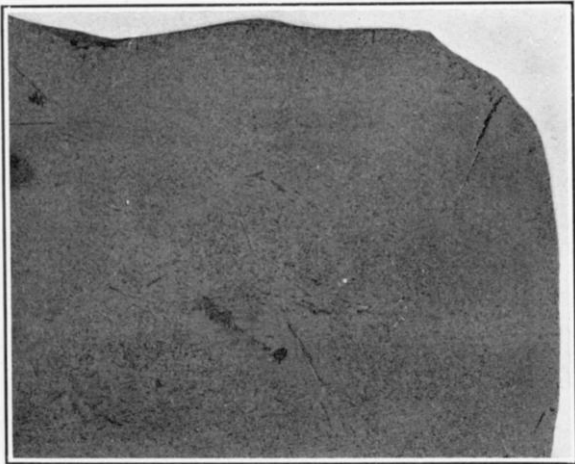


FIG. 44.

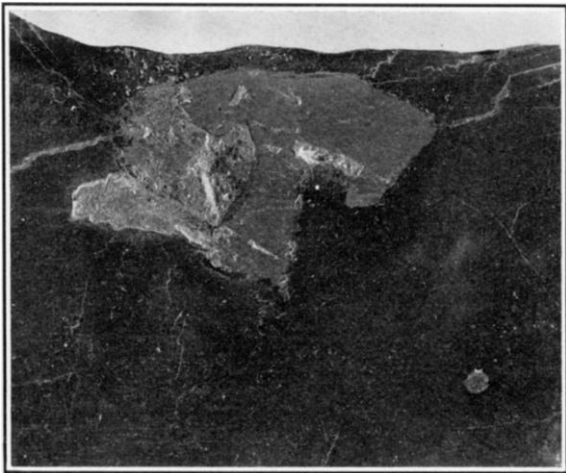


FIG. 45.

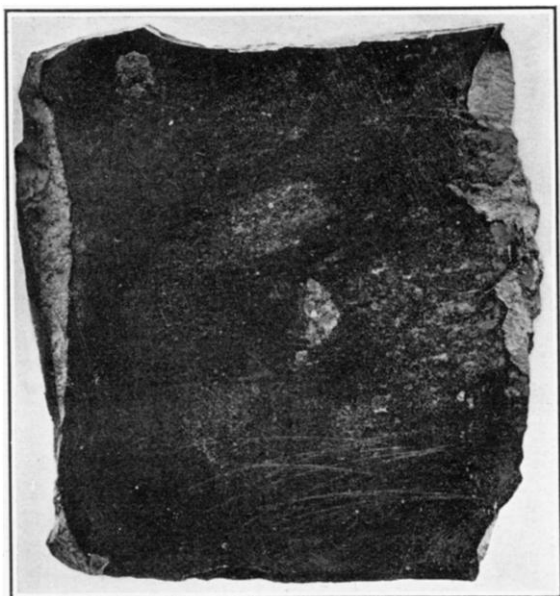


FIG. 46.



FIG. 47.

BREZINA—METEORITES.

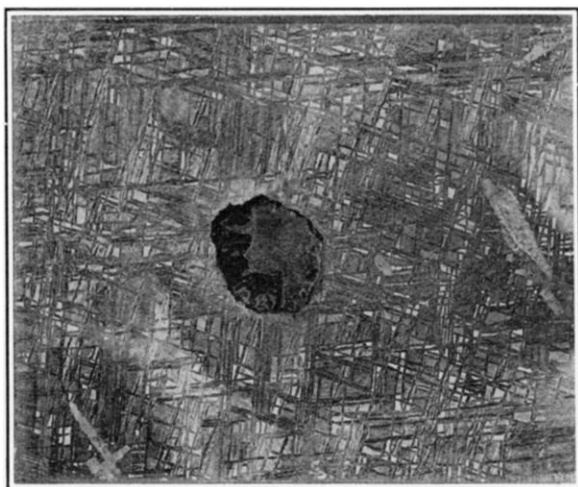


FIG. 48.



FIG. 49.

Niakornak, Greenland. Found 1819. (1 gr., VI.)

Sao Francisco, Brazil. Found 1874. (479 gr., V; 26 gr., VI.)

Nikolajewskaja Wosimskaja, Russia. Found 1883. 87 gr. 8 cm.

Artificial Products.

Glowed Steel. (1 gr., VI.)

Devitrified molten Pitchstone. (VI.)

IX. DUPLICATES FOR EXCHANGES.

In a synoptical collection the duplicates destined for exchanges should be registered separated from the pieces of the main collection by three reasons: to avoid the constant moving of weights in the catalogue, to avoid parting with specimens, which show important peculiarities and to enable directors or owners of other collections to arrange propositions for exchange.

As the present article has a more theoretical scope, duplicates were not registered at all; they form a series of 90 localities in the weight of together 85 kilograms.

A SYSTEM OF PASSENGER CAR VENTILATION.

BY CHAS. B. DUDLEY, PH.D.,
CHEMIST, PENNSYLVANIA RAILROAD COMPANY.

(Read April 8, 1904.)

The ventilation of passenger cars is no small problem. The ordinary passenger coach includes about 4,000 cubic feet of space, and the difficulties of the problem will be apparent when it is stated that it is proposed to take into this limited space sixty people, to keep them in that space for from four to six hours at a time, to keep them warm enough for their comfort in winter, to supply them with the necessary amount of fresh air, and at the same time to, as far as possible, exclude objectionable material from without, such as smoke and cinders. It is perhaps not strange, in view of the small space and large number of people and the inclemency of the weather, that progress in the solution of the problem has been slow. It is believed that the system which will be described is a decided step forward in this matter, and while it may not be the